Name: Date:

Polynomial Factoring solution (version 621)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 19 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(19)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 76}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-72}}{2}$$

$$x = \frac{2 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{2 \pm 6\sqrt{2}\, i}{2}$$

$$x = 1 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $5 - 6i$ and $-7 + 2i$ in standard form $(a + bi)$.**

Solution

$$(5 - 6i) \cdot (-7 + 2i)$$

$$-35 + 10i + 42i - 12i^2$$

$$-35 + 10i + 42i + 12$$

$$-35 + 12 + 10i + 42i$$

$$-23 + 52i$$

Polynomial Factoring solution (version 621)

3. **Write function $f(x) = x^3 + x^2 - 22x - 40$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	1	-22	-40
-4		-4	12	40
	1	-3	-10	0

$$f(x) = (x+4)(x^2 - 3x - 10)$$

$$f(x) = (x+4)(x-5)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+3)^2 \cdot (x-2) \cdot (x-5)^2 \cdot (x-8)^2$$

Sketch a graph of polynomial $y = p(x)$.